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| 10/055,310      | 01/22/2002  | Hamid Noorbakhsh     | 4150D1/ETCH/DRIE/JBI | 9294             |

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APPLIED MATERIALS, INC.  
2881 SCOTT BLVD. M/S 2061  
SANTA CLARA, CA 95050

EXAMINER

ALEJANDRO MULERO, LUZ L

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1763

3

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/055,310

Applicant(s)

NOORBAKHS ET AL.

Examiner

Luz L. Alejandro

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: reference number 350a. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: reference numbers: 152 (fig. 1), 350 (fig. 3), 132 (fig. 6). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

The disclosure is objected to because of the following informalities: reference character "332" has been used to designate both a mating coupling (paragraph 0039) and a throttle valve (paragraph 0059). Appropriate correction is required.

***Claim Objections***

Claim 1 is objected to because of the following informalities: at line 6, before "outlet", -- an -- should be inserted for proper grammar. Appropriate correction is required.

Claim 30 is objected to because of the following informalities: the claim has two periods (line 2). Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 35 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 35 requires that "the passage is at least partially disposed in at least one of the first or second cylindrical walls" but claim 35 depends on claim 33 which requires a "a passage disposed at least partially in the base". It is not clear how the passage is disposed at least partially in the base and at least partially in at least one of the first or second cylindrical walls. It seems from the specification and from the drawings that one of the cylindrical walls or the base have a passage disposed within but such passages are not in contact or related to each other. Clarification is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 5, 11 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Masuda et al., U.S. Patent 6,171,438.

Masuda et al. shows the invention as claimed including a thermally controlled apparatus for lining a processing chamber comprising: a base (105 in fig. 1 and bottom wall in figs. 6-8); an inner wall 103 connected to the base; a passage disposed in the inner wall (see col. 7, lines 24-43); an outer wall 102 connected to the base; a pumping port 106; the base, the outer wall and the inner wall are comprised of a material selected from the group of aluminum and ceramic (see col. 7, lines 37-42).

Furthermore, note that inner wall 103 works as a liner for sidewall 102, is removably disposed in the processing region. Also, the passage disposed in the inner wall is adapted to fluidly isolate a heat transfer fluid flowing therethrough from the process volume.

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Claims 1-3, 5, 7-10, 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Shan et al., EP 0 814 495.

Shan et al. shows the invention as claimed including: an aluminum base 22; a removable cylindrical inner wall/liner 10; a passage 23 in the inner wall having an inlet and an outlet; an outer wall 20 comprising a pumping port 50; a center member (top center part of member 10); a flange (top outer part of member 10); wherein the inner wall is cylindrical and projects from the center member inside of the flange and a passage disposed in the center member having an inlet and an outlet (see fig. 1); a lid 24 disposed opposite the cylindrical wall, the lid and the wall defining a plenum at least partially therebetween (see fig. 1); a plurality of nozzles disposed in the center member providing fluid access to the plenum; a gas feedthrough fluidly coupled to the plenum through a hole disposed in the lid (see page 4, lines 25-27). For a complete description of the apparatus see fig. 1, page 3-line 20 to page 4-line 45, and page 9, lines 7-46.

Claims 1-3, 5, 36-37 are rejected under 35 U.S.C. 102(a) as being anticipated by Pu et al., WO 99/48130.

Pu et al. shows the invention as claimed including: an aluminum base 14; a removable cylindrical inner wall/liner 26; a gas passage in the inner wall having an inlet and an outlet (see page 5, lines 10-11); an outer wall 12 comprising a pumping port 24. For a complete description of the apparatus see fig. 1, page 4-line 14 to page 5-line 11 and page 11, lines 16-28).

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With respect to claims 36-37, the reference further discloses a center member 10 having a first side adapted to be exposed to the processing region and coupled to end of the cylindrical wall; and a passage at least partially disposed in the center member and adapted to isolate a heat transfer fluid flowing therethrough from the processing volume (see page 11, lines 16-28)

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al., U.S. Patent 6,171,438 in view of Collins et al., EP 0 807 953 A1.

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Matsuda et al. is applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Matsuda et al. as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al., U.S. Patent 6,171,438 in view of Reimold, DE 31 10489 A1.

Matsuda et al. is applied as above but does not expressly disclose the use of bosses. Reimold discloses the use of bosses for providing connection for the supply or the removal of a heat exchanging medium (see equivalent abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use bosses in the apparatus of Masuda et al. in order to provide connection for the supply and removal of the heat exchanging medium.

Claims 15-16, 20, 22 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda et al., U.S. Patent 6,171,438.

Masuda et al. is applied as above but does not expressly disclose the claimed cylindrical or annular shape of the liner walls and the base. However, the configuration of the claimed liner wall and the base is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular



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configuration of the claimed liner wall and the base are significant (In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)).

With respect to claim 36, note that Masuda et al., further discloses a center member 201 having a first side adapted to be exposed to the processing region and coupled to one end of the inner wall 103 and outer wall 102, and a passage 117 at least partially disposed in the center member (see fig. 6). Concerning claim 37, note that Masuda et al. further discloses the use of a heat exchanging medium which circulates through a center member comprising the gas showerhead (plate 111) for controlling the temperature of the plate (see fig. 1 and col. 8, lines 16-21). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of the embodiment shown in fig. 6 of Masuda et al. as to further include a heat transfer medium circulating through the center member 201 in order to efficiently and effectively control the temperature of the plate.

Moreover with respect to claim 37 and regarding claims 38-39, fig. 1 of Masuda et al. shows the claimed apparatus comprising a center member (111/115) having a first side adapted to be exposed to the processing region, a wall 116 extending from the first side of the center member and lining at least a portion of the wall 103 and wall 113 of the processing chamber; a passage at least partially disposed in the center member, the passage adapted to isolate a heat transfer fluid flowing therethrough (see col. 8, lines 16-21); a lid 114; and a plurality of nozzles disposed in the center member.

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Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al., U.S. Patent 6,171,438 as applied to claims above 15-16, 20, 22 and 36-39, and further in view of Collins et al., EP 0 807 953 A1.

Matsuda et al. is applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Matsuda et al. as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al., U.S. Patent 6,171,438 in view of Banholzer et al., U.S. Patent 5,565,058.

Matsuda et al. is applied as above but does not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Matsuda et al. as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Collins et al., EP 0 807 953 A1.

Shan et al. is applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claims 11, 15-17, 20, 22-23, are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Matsuda et al., U.S. Patent 6,171,438.

Shan et al. shows the invention substantially as claimed including an apparatus for lining a processing region defined at least partially by sidewalls 20 and bottom 22 of a processing chamber, comprising: a cylindrical dielectric liner 10 adapted to be removably disposed in the processing region and comprising a lip 14 extending into the process volume (see page 9, lines 10-11).

Shan et al. does not expressly disclose a passage disposed at least partially in the liner and adapted to fluidly isolate a heat transfer fluid flowing therethrough from the process volume. Matsuda et al. discloses an apparatus comprising a liner 103 having a heat exchanging medium supply means 104 to control the temperature of the side wall 102. In view of this disclosure, it would have been obvious to one having ordinary skill

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in the art at the time the invention was made to modify the apparatus of Shan et al. by supplying a heat transfer medium through the liner because such structure is known to be a suitable alternative for controlling the temperature of the side wall.

Claims 12, 14, 21, 25-26, 28-31, 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Matsuda et al., U.S. Patent 6,171,438 as applied to claims 11, 15-17, 20, 22-23 above, and further in view of Collins et al., WO 97/08734.

Shan et al. and Matsuda et al. are applied as above and Shan et al. further discloses a cylindrical liner 12 removably disposed in the processing region, comprising a lip 16, and configured to line a substrate support (see page 9, lines 25-27); a base 13 disposed adjacent the bottom of the chamber and having a perimeter from which the liner 12 extends and coupled to liner 10.

Shan et al. and Matsuda et al. do not expressly disclose a passage to isolate a heat transfer fluid defined between the base and the bottom of the chamber. Collins et al. discloses an apparatus having a liner 2150 disposed adjacent the bottom of the chamber and thermally couple to a cold sink 2155 (see fig. 48A and page 65-line 34 to page 66-line 18). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Matsuda et al. as to further comprise the cold sink as taught by Collins et al. in order to optimize the apparatus by maintaining a temperature well-below the polymer condensation temperature, therefore avoiding the risk of contamination.

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Claims 6, 13 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Matsuda et al., U.S. Patent 6,171,438 and Collins et al., WO 97/08734 as applied to claims 12, 14, 21, 25-26, 28-31, 33-35 above, and further in view of Reimold, DE 31 10489 A1.

Shan et al., Matsuda et al. and Collins et al. are applied as above but do not expressly disclose the use of bosses. Reimold discloses the use of bosses for providing connection for the supply or the removal of a heat exchanging medium (see equivalent abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use bosses in the apparatus of Shan et al. modified by Masuda et al. and Collins et al. in order to provide connection for the supply and removal of the heat exchanging medium.

Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Matsuda et al., U.S. Patent 6,171,438 as applied to claims 11, 15-17, 20, 22-23 above, and further in view of Collins et al., EP 0 807 953 A1.

Shan et al. and Matsuda et al. are applied as above but do not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Matsuda et al. as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

With respect to claim 19, it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to disposed the magnet in the lip since the surface of the lip extends into gap 54, thereby confining the plasma more effectively and efficiently within the processing volume, and therefore reducing and/or preventing the flow of plasma towards the exhaust port which can lead to contamination and/or damage problems.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Matsuda et al., U.S. Patent 6,171,438 as applied to claims 11, 15-17, 20, 22-23 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Shan et al. and Matsuda et al. are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Matsuda et al. as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Matsuda et al., U.S. Patent 6,171,438 and Collins et al., WO 97/08734 as applied to claims 12, 14, 21, 25-26, 28-31, 33-35 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Shan et al., Matsuda et al. and Collins et al. are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Matsuda et al. and Collins et al. as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claims 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Matsuda et al., U.S. Patent 6,171,438 or Pu et al., WO 99/48130.

Shan et al. is applied as above but does not expressly disclose the claimed limitations. Masuda et al. discloses the use of a heat exchange medium which circulates through a center member comprising the gas showerhead for controlling the temperature of the member (see fig. 1 and col. 8, lines 16-21). Furthermore, Pu et al. discloses a heat exchanging medium which circulates through the center member 10 in

order to regulate the temperature of the member. Therefore, in view of these disclosures, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. as to further include a heat transfer medium circulating through the center member in order to efficiently and effectively control the temperature of the member.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Collins et al., EP 0 807 953 A1.

Pu et al. is applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claims 7-10 and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Shan et al., EP 0 814 495 A2.

Pu et al. is applied as above but does not expressly disclose the claimed structural limitations. Shan et al. discloses an apparatus having a center member being circumscribed by a flange and from which a cylindrical wall 10 projects, wherein the lid is disposed so as to define a plenum with the wall from which a fluid is coupled to the processing volume through plurality of nozzles (see fig. 1 and page 3-line 20 to page 4-



line 45, and page 9, lines 7-46). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. as to comprise the center member/lid/gas supply structure taught by Shan et al. in order to optimize the apparatus since such arrangement will provide for a more uniform distribution of the gas(es) into the chamber and towards the substrate.

Claims 11, 15-17, 20, 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Matsuda et al., U.S. Patent 6,171,438.

Pu et al. shows the invention as claimed including: an aluminum base 14; a removable cylindrical inner wall/liner 26 and comprising a lip extending into the process volume; a gas passage in the inner wall having an inlet and an outlet (see page 5, lines 10-11); an outer wall 12 comprising a pumping port 24; a lid 10 disposed opposite the cylindrical inner wall. For a complete description of the apparatus see fig. 1, page 4-line 14 to page 5-line 11 and page 11, lines 16-28).

Pu et al. does not expressly disclose a passage disposed at least partially in the liner and adapted to fluidly isolate a heat transfer fluid flowing therethrough from the process volume. Matsuda et al. discloses an apparatus comprising a liner 103 having a heat exchanging medium supply means 104 to control the temperature of the side wall 102. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. by

supplying a heat transfer medium through the liner in order to control the temperature of the side wall.

Claims 12, 14, 21, 25-26, 28-31, 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Matsuda et al., U.S. Patent 6,171,438 as applied to claims 11, 15-17, 20, 22-23 above, and further in view of Collins et al., WO 97/08734.

Pu et al. and Matsuda et al. are applied as above and Pu et al. further discloses a cylindrical liner 27 removably disposed in the processing region, comprising a lip, and configured to line a substrate support (see page 9, lines 25-27); and a base disposed adjacent the bottom of the chamber and having a perimeter from which the liner 27 extends and coupled to liner 26.

Pu et al. and Matsuda et al. do not expressly disclose a passage to isolate a heat transfer fluid defined between the base and the bottom of the chamber. Collins et al. discloses an apparatus having a liner 2150 disposed adjacent the bottom of the chamber and thermally couple to a cold sink 2155 (see fig. 48A and page 65-line 34 to page 66-line 18). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Matsuda et al. as to further comprise the cold sink as taught by Collins et al. in order to optimize the apparatus by maintaining a temperature well-below the polymer condensation temperature, therefore avoiding the risk of contamination.

Claims 6, 13 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 A2 in view of Matsuda et al., U.S. Patent 6,171,438 and Collins et al., WO 97/08734 as applied to claims 12, 14, 21, 25-26, 28-31, 33-35 above, and further in view of Reimold, DE 31 10489 A1.

Pu et al., Matsuda et al. and Collins et al. are applied as above but do not expressly disclose the use of bosses. Reimold discloses the use of bosses for providing connection for the supply or the removal of a heat exchanging medium (see equivalent abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use bosses in the apparatus of Pu et al. modified by Matsuda et al. and Collins in order to provide connection for the supply and removal of the heat exchanging medium.

Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Matsuda et al., U.S. Patent 6,171,438 as applied to claims 11, 15-17, 20, 22-23 above, and further in view of Collins et al., EP 0 807 953 A1.

Pu et al. and Matsuda et al. are applied as above but do not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Matsuda et al. as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

With respect to claim 19, it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to disposed the magnet in the lip since the surface of the lip extends into gap 54, thereby confining the plasma more effectively and efficiently within the processing volume, and therefore reducing and/or preventing the flow of plasma towards the exhaust port which can lead to contamination and/or damage problems.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Matsuda et al., U.S. Patent 6,171,438 as applied to claims 11, 15-17, 20, 22-23 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Pu et al. and Matsuda et al. are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Matsuda et al. as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Matsuda et al., U.S. Patent 6,171,438 and Collins et al., WO

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97/08734 as applied to claims 12, 14, 21, 25-26, 28-31, 33-35 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Pu et al., Matsuda et al. and Collins et al. are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Matsuda et al. and Collins et al. as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

A handwritten signature in cursive script, appearing to read "Luz L. Alejandro".

Luz L. Alejandro  
Primary Examiner  
Art Unit 1763

April 21, 2003